

Amendment and Response

Applicant: Steve Golden

Serial No.: 10/715,797

Filed: November 18, 2003

Docket No.: P0021729.02 / M190.321.101

Title: APPARATUS AND METHODS FOR ANASTOMOSIS

IN THE CLAIMS

Please amend claims 64, 66, 76, 123, 127, and 128 as follows:

1. – 63.(Cancelled)

64.(Currently Amended) A method for performing an anastomosis while maintaining blood flow within a vessel comprising:

positioning a piercing end of a cannula so that it extends pierces through a vessel wall, wherein the cannula is introduced into the vessel wall from the interior of the vessel;

attaching a graft to the vessel wall adjacent to said cannula while said piercing end of said cannula extends through said vessel wall; and

removing the cannula.

65.(Cancelled)

66.(Currently Amended) A method for performing an anastomosis on a vessel wall while maintaining blood flow within the vessel comprising:

forming an opening in a wall of a blood vessel and removing a portion of the wall where the opening was formed;

inserting an occluding member into the opening formed in the vessel and occluding the opening therewith; and

anastomosing connecting a graft to the vessel at the opening after the step of forming an opening and removing a portion of the wall.

67.(Previously Presented) The method of claim 66, wherein said forming an opening comprises: piercing the vessel wall with a piercing member extending from a shaft; and

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cutting the opening in the vessel wall around the piercing member shaft with a cutting tool.

68.(Original) The method of claim 67, further comprising removing a tissue plug produced by said cutting, prior to said inserting an occluding member.

69(Original) The method of claim 67, wherein said inserting comprises inserting the occluding member into the opening cut into the vessel while the cutting tool is still in the opening.

70.(Original) The method of claim 69, further comprising withdrawing the cutting tool to allow the occluding member to expand against the periphery of the opening, thereby occluding it.

71.(Original) The method of claim 70, further comprising placing a graft over the occluding member and in alignment with the opening, prior to said anastomosing.

72.(Previously Presented) The method of claim 67, further comprising sliding a generally circular centering disk along the piercing member shaft onto the vessel wall, prior to said cutting, thereby clamping vessel wall tissue between the centering disk and a portion of the piercing member.

73.(Previously Presented) The method of claim 72, further comprising removing the clamped vessel wall tissue between the centering disk and the portion of the piercing member.

74.(Original) The method of claim 66, wherein said anastomosing comprises fastening walls of the graft and vessel together using fasteners.

75.(Original) The method of claim 74, wherein said fastening is performed with self closing fasteners.

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76.(Currently Amended) A method for performing an anastomosis on a vessel wall while maintaining blood flow within the vessel comprising:

forming an opening in a wall of a blood vessel and removing a portion of the wall where the opening was formed;

inserting an occluding member into the opening formed in the vessel and occluding the opening therewith; and

anastomosing a graft to the vessel at the opening;

wherein the occluding member includes fasteners attached thereto and the fasteners have needles coupled thereto, said method further comprising expanding the occluding member and pulling back said occluding member piercing member and piercing the vessel wall with the needles coupled to said fasteners.

77.(Previously Presented) A method for performing an anastomosis on a vessel wall while maintaining blood flow within the vessel comprising: forming an opening in a wall of a blood vessel; inserting an occluding member into the opening formed in the vessel to occlude the opening with the occluding member; and anastomosing a graft to the vessel at the opening; wherein the occluding member includes fasteners attached thereto and the fasteners have needles coupled thereto, said method further comprising pulling back said occluding member to pierce the vessel wall with the needles; further comprising grasping the needles and pulling them entirely through the vessel wall, thereby positioning the fasteners for performing the anastomosis and separating them from the occluding member.

78.(Original) The method of claim 77, wherein the fasteners each have a second needle at an end opposite the location of the needles used to pierce the vessel wall, said anastomosing further comprising piercing the graft with the second needles and securing the graft and the vessel together by closing the fasteners upon them.

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79.(Previously Presented) A method for performing an anastomosis on a vessel wall while maintaining blood flow within the vessel comprising: forming an opening in a wall of a blood vessel; inserting an occluding member into the opening formed in the vessel to occlude the opening; and anastomosing a graft to the vessel at the opening; wherein said forming an opening comprises: piercing the vessel wall with an anchor member and cutting the opening in the vessel wall around the anchor member with a cutting tool; wherein an adapter is mounted on the cutting tool, the adapter retaining a plurality of needles therein which are prepositioned for piercing the vessel from the inside out, said method further comprising inserting the cutting tool and adapter into the vessel, prior to said inserting an occluding member, so as to position the needles against the inner wall of the vessel, and pulling back the adapter and cutting tool to pierce the vessel wall with the needles; grasping the needles and pulling them all the way through the vessel and thereby also removing them from the adapter.

80.(Original) The method of claim 79, wherein the needles are connected to two-stage release fasteners having independently closable first and second portions, the needles being connected by flexible members to respective first portions of the fasteners, said method further comprising removing the needles and flexible members from the fasteners, after insertion of the occluding member, thereby closing the first portions of the fasteners and fixing the fasteners to the wall of the vessel.

81.(Original) The method of claim 80, wherein the fasteners each have a second needle connected to an end portion of the second portion thereof by a second flexible member, said anastomosing further comprising piercing the graft with the second needles and securing the graft and the vessel together by removing the second needles and second flexible members from the second portions of the fasteners, thereby closing the second portions of the fasteners on the graft and fixing the walls of the vessel and the graft in approximation.

82. – 122.(Cancelled)

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123.(Currently Amended) A method for performing an anastomosis while maintaining blood flow within a vessel comprising:

positioning a cannula so that it extends through a vessel wall, wherein the cannula is introduced into the vessel wall from the interior of the vessel;

attaching a graft to the vessel wall adjacent to said cannula while said cannula extends through said vessel wall; and

removing the cannula;

wherein the cannula is passed through another portion of the vessel wall ~~and~~ into the interior of the vessel and then from the interior of the vessel through the said vessel wall.

124.(Previously Presented) The method of claim 64 wherein the cannula is delivered endovascularly through the vessel.

125.(Previously Presented) The method of claim 64 wherein the cannula forms an area of hemostasis.

126.(Previously Presented) The method of claim 66 wherein said occluding member comprises a cannula.

127.(Currently Amended) A method for performing an anastomosis comprising:

delivering a tubular member having a first end and a second end into the interior of a vessel having a vessel wall;

passing the first end of the tubular member from the interior of the vessel through the vessel wall at a first vessel wall location;

attaching a graft to the first vessel wall location adjacent to the first end of the tubular member; and

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removing the tubular member.

128.(Currently Amended) A method for performing an anastomosis comprising:

delivering a tubular member having a first end and a second end into the interior of a vessel having a vessel wall;

passing the first end of the tubular member from the interior of the vessel through the vessel wall at a first vessel wall location;

attaching a graft to an exterior of the vessel wall adjacent to the first end of the tubular member; and

removing the tubular member

wherein the tubular member is passed through the vessel wall at a second location to deliver the first end of the tubular member into the interior of the vessel before passing the first end of the tubular member from the interior of the vessel through the vessel wall at the first vessel wall location.

129.(Previously Presented) The method of claim 127 wherein the tubular member is delivered endovascularly through the vessel.

130.(Previously Presented) The method of claim 127 wherein the tubular member forms an area of hemostasis.

131.(Previously Presented) The method of claim 127 wherein the tubular member comprises a cannula.

132.(Previously Presented) The method of claim 66 wherein said occluding member is radially expandable.

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133.(Previously Presented) The method of claim 132 wherein said occluding member comprises a plurality of wires having a memory shape.

134.(Previously Presented) The method of claim 133 further including a restraint to releasably hold the plurality of wires in a shape that differs from said memory shape.

135.(Previously Presented) The method of claim 132 wherein said occluding member comprises an expandable membrane.

136.(Previously Presented) The method of claim 135 wherein said expandable membrane is an inflatable member.

137.(Previously Presented) The method of claim 135 further including a sheath extending over a portion of said occluding member.

138.(Previously Presented) The method of claim 132 wherein said occluding member comprises a plurality of expansion members and a membrane between the expansion members.

139.(Previously Presented) The method of claim 132 wherein said occluding member forms an umbrella.

140.(Previously Presented) The method of claim 132 wherein said occluding member comprises a flexible sealing member.

141.(Previously Presented) The method of claim 140 further including a restraining sheath slidably mounted to the flexible sealing member for restraining the flexible sealing member and withdrawing the restraining sheath to expand the occluding member.